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ABSTRACT

This is a description/discussion of many of the current situations in teacher education around the world, and from these are projected future changes. It is stated that the role of a teacher is changing as the world is changing; consequently, teacher training is changing with emphasis on social science methodology and clinical training. Other current developments noted, which will continue to bloom into the future, are new specialists, educational technology, education training for college teachers, and a new interest in life-long teacher education and rural education. (JA)

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TEACHER EDUCATION: WHAT NEXT?

by

Seth SPAULDING[1]

> "Teachers next to students, are the largest, most crucial inputs of an educational system. They are also, by all odds, the most expensive inputs, even when they are underpaid. Teachers, in fact, lie at the heart of the educational crisis.."[2]

Well over 600 million people in the world today are attending school at the primary, secondary or higher education level and there are over seventeen million teachers teaching them[3]. Add to this figure those employed in some way in servicing education, ranging from those who clean the schools to those who print textbooks and those who run educational television stations, and it is easy to see why education is the largest single social expenditure of most countries.

Many countries spend 25% or more of their national budgets on formal education[4] and most of this is spent on salaries - as much as 90% in some countries.

In Latin America, about 40% of the teaching force is considered unqualified. In Africa and Asia the figure is closer to 50%. These unqualified teachers are often men and women who have had no more formal education than the children or students they are teaching. In more highly developed countries, of course, teachers may be considered non-qualified or underqualified even though they have a high level of general education, including a university degree, but without special training to become teachers.

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(2) The World Educational Crisis, Philip Coombs, Oxford University Press, New York, London, Toronto, 1968, p.34.

(3) See Annex for Estimated Number of Teachers by Level of Education, 1968/1969.

(4) Not including expenditures for many other kinds of educational activities usually not reported in education budgets, such as agricultural extension, health education, co-operative education and training components of various government ministries and departments.

In all countries the problems of teachers' status, remuneration, education and re-education head the list of all problems related to education. There are a few governments which are fully satisfied with the present system of teacher education and which are not looking for new ways to prepare teachers more effectively and efficiently.

WHO ARE TEACHERS?

We expect much of teachers for, after all, the future is in their hands. It is reasonable to wonder who these people are to whom we entrust several thousand precious hours of our children's time, as they pass from childhood to adulthood.

In the past, the teacher in many countries commanded a great deal of community respect by virtue of his uniqueness. However limited his education, it was far superior to the majority of the population. He, in turn, had the task of preparing the small number who had access to the limited school places. In the days before rapid national development, there was limited opportunity in other areas of employment and one of the respectable things an educated person could do was to teach.

Rapid development in other areas coupled with the democratization of education has changed much of this. There are no longer only relatively few teachers in a community, but many. Teaching is not one of the most prestigious professions now that it is a mass enterprise, and now that there are many employment opportunities which are much more remunerative and prestigious in other sectors.

Thus, there is an unmistakable trend toward the brightest, most highly-qualified students entering other professions than teaching. This is especially pronounced in the case of male students, and in some countries it is increasingly rare to find a male teacher at the elementary level, although the secondary level still attracts some.

In order to get enough teachers at the price the countries feel they can afford, a number of approaches are being taken. One is to lower the standards of admittance to the teacher-training institution so as to attract those who find it difficult to compete in other streams of the educational system. Another, popular in some French-speaking African countries, is to use "monitors" in the classroom; in essence, underqualified teachers, several of whom work under the supervision of one better qualified teacher. A third is to offer better scholarships and other financial incentives to those students who enter teacher-training institutions than those who enter other institutions, often with a contract binding the student to teach for several years after completing his course, unless he wishes to repay the scholarship.

The problem is further exaggerated by the demand in many countries for the more highly-qualified teachers which they deem necessary to prepare students for a nation that is attempting to develop rapidly and which needs

highly qualified graduates from the system which the teachers manage. As teacher-education programmes are integrated into the university or, at least, are at the same level as the university, it becomes increasingly difficult to get students to enter teacher education rather than another university career. In at least one Latin American university, when students preparing for secondary teaching had to pass the same two-year basic studies course as all other students before entering the education faculty, those who elected teaching as a profession were negligible. Since they were qualified to enter any faculty after passing the basic studies course, almost all would choose another faculty than education.

With women students, the situation is critical in another sense. Although a number of qualified women students enter education, since they are not as attracted to many other professions as are men, many do not teach when they finish. If they do not marry and start a family, they often will take office posts, or otherwise leave the teaching profession.

Teacher education, thus, is intimately linked with the status of the teaching profession. As long as the profession expects miracles from teachers but pays them a pittance, as long as teaching conditions in schools are primitive and unattractive, less than the most highly qualified will be attracted to teaching. This, in turn, contributes to the ineffectiveness of schools as characterized by high drop-out and wastage rates. This is the vicious circle of education in many countries: education is wasteful and inefficient, and thus extremely costly in terms of numbers of successful students produced, and this inefficiency, in turn, makes it difficult to pay teachers more and to improve the teaching-learning environment in the school.

This, perhaps, is one of the major challenges: how to break the vicious circle. Would better-paid teachers attract better-quality teachers and thus improve the efficiency of the system so that the per-unit cost of successful graduates would not be much more than at present? Would better school facilities, teaching materials and the like, attract better teachers and improve efficiency? Probably both are needed. High-quality teachers can produce results only with adequate teaching facilities and resources, and modern teaching environments and materials, in turn, demand high-quality teachers if they are to be used properly.

THE CHANGING ROLE OF THE TEACHER

The teacher teaches in a world he never knew when he was a student only a few years ago. His changing rôle is linked to the changing rôle of education in the lives of students, the changing nature of students themselves, changing aspirations of parents and students, and, in general, societal changes. Of great significance in the last generation or two has been the remarkable explosion of knowledge and of the curriculum, the advent of television and other mass media which make it possible for students to develop more knowledge and insight outside the formal school than ever before, and the tremendous increase in school enrolment.

Whereas in days gone by the school and the teacher represented the basic source of "learning" for young people, it is obvious that in many countries young people these days learn more out of school than in school. The new function of the school must be to help students structure and harness the knowledge, skills and attitudes which they acquire elsewhere and to help them understand the processes at work around them. If students can be helped in constructing a structure and approach for the processing of new experience with which they are constantly bombarded through the mass media and through an environment generally rich in stimuli, this is surely the central rôle for the school and the teacher.

As yet most schools have not caught up with the present. It is pitiful to look in on some secondary science classes which are teaching children to memorize all but meaningless formulae while they are, outside the class, learning advanced physics from the newspaper accounts of how the latest rocket escaped the earth's gravity field on its way to the moon; while those youngsters who are interested in aviation are learning in popular magazines all about aerodynamics and supersonic stress; while those interested in electronics are already building their own transistor radios from kits which are easily and cheaply available.

Even in less wealthy countries where the technological environment is not, as yet, as rich, new forms of communication are spreading new insights and information with a speed unheard of in earlier days. The remotest African, Latin American or Asian village will blare forth with transistor radios, and many are benefiting from increasingly extensive television systems.

And certainly the environment is exciting, if in a non-technological way, even in the poorest country. Why should children be studying the geology or biology of countries other than their own with rich field experience in their own villages and fields?

Certainly, the explosion of knowledge changes dramatically what the teacher must teach. No longer are reading, writing and simple mathematical skills enough. The knowledge explosion surely demands that the teacher know more so as to be able to prepare students who will know more.

The democratization of education changes the rôle of the teacher in another way. No longer does a teacher prepare primarily the élite of a society. Everyone has the right to education; thus, education is to prepare for citizenry and participation in all walks of life, and not just the élite professions. With such a mandate, what goes on in the school, and what the teacher does, must be more broadly based than in years gone by.

Under these and other pressures, pedagogical approaches are beginning to change, consistent with the new rôles of the teacher and the school. Whereas modifications to date have been largely in the form of finding ways of dealing with increasing numbers of students in traditional classrooms, innovations of the future will revolve around new teaching methodologies,

non-traditional classrooms, new structures of the educational system, increased uses of new kinds of educational materials, and new strategies ranging from team teaching to television instruction to individualized self-study. All of these strategies require new kinds of teachers and new kinds of teaching skills.

PRE-SERVICE EDUCATION

In order to educate a teacher or an educational specialist, it is necessary to do a clear analysis of the skills, attitudes and knowledge he must have in order to perform effectively in educating children. The teacher's functions are many and varied. He not only interacts with children in a variety of ways, but he sets learning goals; he manages a teaching environment which may include a variety of teaching devices, laboratory equipment, meeting rooms, playgrounds, and so on; he does research, on the one hand to find out more about his students, their interests, how well they are doing, and on the other, to find out more about whatever he is teaching so that he can keep up with his field; he assists educational research and development specialists with their work; he provides a variety of services within the school and to the community, including visits with parents, guidance services to students, talks and lectures when so invited by community groups; and especially in developing countries, he is often called on to perform community development activities of one kind or another, including the handling of literacy classes in the evening, the teaching of basic skills training for adults, help in organizing co-operatives, and so on.

Do most teacher-training teacher-education programmes specifically educate for the skills necessary for all of the above? Undoubtedly many do not.

PROFESSIONAL VERSUS ACADEMIC TRAINING

One of the basic issues in teacher education has always been the relationship between professional training and academic training. It is increasingly accepted these days that in fact there are at least three interrelated parts of a teacher-education programme: (1) academic training in more or less traditional disciplines, (2) interdisciplinary education necessary to understand and live effectively in a changing world, and (3) professional education necessary to develop the skills, knowledge and attitudes necessary in an increasingly technological school environment.

Over the past fifteen years there has been greatly increased interest on the part of academicians in the methodologies appropriate to the teaching of each discipline. It is now respectable for a physicist or a biologist or a chemist or linguist to dedicate a portion or even all of his career to problems of teaching and learning in his field. Partly because of this, and partly because of the increased interest of those in the social sciences (psychologists, sociologists, anthropologists, etc.) in educational

problems, there is less and less controversy concerning the need for professional education on the part of a teacher. It is now generally agreed by subject matter specialists and methodologists alike that it takes more than ability to pass an examination in a discipline to be able to teach it well.

A number of teacher-education institutions have faculties with joint responsibilities in both the academic department of their specialty and in the professional training component of the programme. Such faculties teach their discipline part of the time and teach how to teach it the rest of the time.

But academic training must not stop with the traditional disciplines. The interdisciplinary portion of teacher education is that which is receiving current attention in many countries. What should a teacher know about the environment, about pollution, population, about the economics and sociology of development, about the problems of his country and its people so that he can lead the next generation with wisdom and conscience? In the relatively few thousand hours that a student is in school, the teacher must shape the citizens of the future. Surely, the interdisciplinary preparation of a teacher will be crucial in affecting what will happen to the thousands of students he will guide during his career.

If there are changes in the academic programme of teachers, there are even more dramatic changes underway on the professional side. The professional education component is generally thought of as consisting of: (1) basic course work in the principles of education, educational philosophy and psychology, educational management and administration, and other so-called "foundations"; (2) clinical training in teaching to give students practice in setting learning objectives and devising teaching techniques appropriate to the achievement of these learning goals; (3) finally followed by internship in a normal setting under supervision, sometimes limited to what has been traditionally called student teaching.

The basic professional course work is moving toward increasing emphasis on social science methodologies in the examination of teaching-learning problems and away from traditional courses in history and philosophy of education. Thus, some teacher-education institutions stress courses on the rôle of education in social change, economic change and political development, courses in child development, the process of setting precise behavioural objectives, and so on. Other institutions include courses in community development, literacy and adult education methods and similar topics, looking to the preparation of the teacher for community rôles broader than the management of children in a classroom.

CLINICAL TRAINING

The emphasis on clinical training (a notion borrowed from the medical profession) as a prior step to internship or student teaching is one of the most significant developments in teacher education in the last ten years. Such clinical training teaches such skills as the art of asking different

kinds of questions - the questions which are rhetorical, the questions which are for the purpose of student evaluation, the questions which are for the purpose of stimulating discussion. It focuses on how to define those teaching skills necessary to encourage students to take responsibility for their own learning. It concentrates on how to create the conditions for discovery, for creativity. Such clinical training alerts teachers in training to the significance of non-verbal behaviour, unconscious or conscious movements and facial expressions which can assist or interfere with learning and teaching. It attempts to develop the skills necessary to understand how people interact with one another in discussions, in working relationships, and in group projects, through techniques known as interaction analysis.

The new technologies assist greatly in the clinical practice of such skills. A student in training will identify the kinds of skills he is going to use in the teaching of a micro-lesson of ten minutes or so. He then actually teaches this lesson to a group of students (perhaps his fellow students or perhaps a group of elementary or secondary students). His teaching performance is recorded, via closed-circuit television, on videotape. Later, he compares, with the teaching methods instructor, what he said he was going to do with what he actually did do when teaching. He can then improve his performance on the basis of study and analysis of his past performance on the videotape.

Many of the newer approaches to clinical training of teachers have been pioneered in the more highly-developed countries. However, a number of institutions in Latin America, Africa and Asia are adopting these approaches, using simpler equipment or no equipment at all. As television videotape recorders costing less than 500 dollars become more readily available, even the most modest budget will be able to afford appropriate equipment to assist in such work. But it is the new techniques of analysis of teaching behaviour that makes the difference, with or without the equipment.

New approaches are similarly under way in the training of teachers in the management functions they increasingly will be required to perform. More sophisticated teaching and learning materials will require more sophisticated management of the learning environment in a school setting. Strategies that place more emphasis on individual study, on group discussion and creative activity will also require new techniques for school scheduling so that students need not all be grouped together doing the same thing at the same time.

EDUCATIONAL TECHNOLOGY

In his September 1968 address to the Board of Governers, the President of the World Bank Group, Robert F. McNamarra, pointed out that "education, normally one of the largest employers in any country, is one of the few industries which has not undergone a technological revolution. We must help to move it out of the handicraft stage. With the terrible and growing

shortage of qualified teachers all over the developing world we must find ways to make good teachers more productive. This will involve investment in textbooks, in audio-visual materials, and above all in the use of modern communication techniques (radio, film and television) for teaching purposes".

It is remarkable that we often continue to train teachers as though they were to run a self-contained traditional classroom for the next 40 years of their careers. Yet it is obvious that in most countries the self-contained classroom will give way to new kinds of educational institutions which require the management of a much more sophisticated array of learning resources than the teacher has ever had in the past. Accordingly, we should be training teachers for skills that will be needed in the management of these new kinds of educational systems that will be upon us within the next generation.

Basic to reform in education have been the various attempts to identify the processes significant in each of the disciplines and in interdisciplinary areas, with the subsequent attempt to design a methodology for teaching these processes so that children will be able to build on these processes throughout their lives. These new curriculum approaches have been translated into a variety of teaching materials, ranging from new kinds of textbooks to teaching modes such as programmed instruction. Many new curriculum materials approaches incorporate series of filmed presentations which can be shown over television or in 8mm cartridge-loaded projectors or in the cartridge videotape playbacks that will be available at modest cost in the near future.

These bits and pieces of instructional materials are giving way to teaching-learning systems, often consisting of an array of work books, teachers' manuals, visual devices, systems of overhead transparencies for presentation, and so on. These systems, in the ideal, are all carefully developed on the basis of specifically defined behavioural objectives, planned with a total strategy of teacher presentations, individual study, group discussion and discovery activities in mind. The materials are tested and revised until they teach typical students what they promise to teach. These new materials, of course, imply the need for all kinds of new skills on the part of teachers and specialists if they are to use the materials properly and if they are to assist students in pursuing the new teaching-learning approaches.

Already many countries have some form of television instruction, but the medium is often used poorly because of limited availability of instructional designers to prepare innovative television sequences and the classroom material to go with the sequences, and of teachers who can use a television approach properly in the classroom. Television instruction will become more sophisticated as time goes on. At the present time it is largely an instrument for the broadcast of a good teacher who is teaching in a television studio. Later, there will be carefully prepared and tested teaching-learning sequences which go beyond what a teacher normally does in a classroom. Principles of programmed instruction will be applied to the television sequences and, in addition to being presented over television,

the sequences may be packaged in the form of 8mm film libraries or in video-tape cartridges available in every classroom for use when the students and teachers wish to use them. These sequences will be integral parts of total teaching and learning packages, and will not be simply the transfer of a course of lectures from the classroom to the television screen.

Technological approaches to education are already changing the face of education in many countries. Spain is undertaking the first significant project to introduce computer-assisted instruction in teacher-education institutions throughout the country. El Salvador, Ivory Coast, American Samoa and a number of other countries are introducing educational reform rapidly into the entire school system via educational television. Teachers are being retrained and new curriculum is being introduced into the classroom simultaneously via television.

In the United States of America, there are experimental projects where students progress through an entire elementary school at their own pace and rhythm, irrespective of what their neighbours may be doing. Cumulative records on each student are such that the teaching staff can know at any point and time the specific tasks that the student has performed during the day, during the past week, during the past month and during the past years. On the basis of this progress, new learning experiences are selected jointly by the teacher and the student.

New strategies such as any of the above require team teaching efforts of all kinds, new kinds of teachers and teaching assistants, and new kinds of teaching skills. These skills must be carefully defined in a teacher-education programme and should be a part of the clinical experience in laboratory teaching and of the later internship and student-teaching experience.

THE NEW SPECIALISTS

In the future, a technological approach to education will mean new kinds of specialist functions in the school. These will include (but not be limited to) educational strategists (now called planners, administrators and supervisors) responsible for the planning and management of the overall educational programme; instructional designers involved in the design and development of curriculum materials and systems appropriate to each aspect of the total strategy; curriculum materials logisticians, expert in the storage, retrieval and transmission of instructional materials (the school librarian of the technological school); and the teaching-learning orchestrator or manager, who will interact with other specialists in the management of the teaching-learning environment and who will guide the students in their day-to-day activities and in their long-term learning careers. This specialist we generally call a teacher.

Supporting the educational environment described above, will be the guidance and counselling specialists, educational research and development

specialists, reading specialists, special education specialists, teaching-learning technologists, computer-assisted instruction specialists, television specialists, teaching assistants and so on. The teacher-education institution which is not preparing these specialists, which is not attempting to define the kinds of specialized skills and abilities that will be needed in the education system of the future, is a teacher-education institution not doing its job. If teacher-education institutions do not prepare these specialists, they will surely not exist and the education system will be one of the past rather than of the future.

The challenge of the teacher-education institution of the future is to identify the skills, abilities and attitudes necessary to develop and run a successful educational system, a system that does not tolerate a high repeater rate, a high drop-out rate, and generally high wastage rates. Teacher and specialist education of the future will include clinical practice in the development of these skills and abilities. In fact, the prime purpose of such an institution should be to prepare teams of educational specialists who can work together in performing the tasks necessary to develop and manage a technologically advanced educational system.

THE LEVELS OF TEACHER EDUCATION

In many countries it is still assumed that the elementary school teacher needs much less education and training than the secondary school teacher, who in turn needs much less than the university teacher.

Yet, all research points to the fact that an adult's personality and approach to life has been largely shaped during his earliest years, probably before the age of ten. There is considerable evidence to suggest that the most highly-skilled teacher should be dealing with pre-school and elementary schoolchildren since this is where the basic personalities and abilities of the children are shaped which will last throughout their lives.

It may be a poor saving to staff primary schools with teachers who have barely completed primary school themselves. This undoubtedly is a contributing factor to wastage and inefficiency in the entire school system, as well as a contributing factor to an adult population which does not contribute fully to development.

A number of countries insist on a university education for elementary teachers, the same as for secondary teachers. Pay scales and status are similar. There is no doubt that this trend will be felt in the future in developing countries as well.

At the university level, it is assumed that a lecturer needs no professional education in how to teach, how to manage learning-teaching resources, how to manage the learning-teaching environment, how to evaluate students, how to offer guidance to students, or any of the other professional things that make for teaching skill. Accordingly, university

teaching is notoriously poor. It generally consists of lecturing at large numbers of students, who in turn write notes on what the lecturer has said, memorize these notes, and later answer examination questions based on them.

Increasingly, universities will demand professional training for their teaching staff. Universities, as well as elementary and secondary school systems, are introducing educational technology, systems of instructional materials, and other teaching-learning devices and strategies. The university teaching staff will have to become expert at the preparation, organization and management of such resources and the guidance of students in their use. The university of the future will not look like the university of the past, either in organization, structure, curriculum or methods, and the university teacher must be trained for the functions he will be expected to perform in such a system.

In technical education, as in university education, it is often assumed that a good technician can teach his trade without any special training in teaching technique. Here again, there is much wastage because of the lack of teaching skills. The most successful technical education programmes, done either in technical schools or in on-the-job training or through a combination of both, are managed by teaching specialists who know how to programme teaching and learning experiences effectively.

THE TEACHER'S ROLE IN LIFE-LONG EDUCATION

The accelerated pace of change makes it clear that what we learn today may be outdated or even erroneous or useless tomorrow. The concept of life-long education is now generally accepted, but the concept has affected educational practice little if at all in most countries.

The ideal, of course, would be a system of educational services available to people of all ages, ranging from the cradle to the grave. These services would be arranged for the convenience of all age groups and the content would be such as to cater to all interests and learning styles and speeds. Much would be in the form of new kinds of self-study centres located together with community services and facilities of all kinds and staffed by a new kind of teacher who would guide those interested in the identification and development of individual interests.

If anything like the ideal of life-long education is to become a reality in the future, teachers must be prepared to participate in these new approaches. Teachers must learn how to work with people of various ages and interests in new teaching and learning modes which are more suitable than the rather deadly approaches used in many self-contained classrooms in the school of today.

In addition, accomplished people in many walks of life must be encouraged to spend a part of their creative effort in teaching others. This means that many successful adults and even outstanding youth must be invited

to teach, as well as to pursue their primary interest, whatever that may be. Only by so enriching the teaching profession can the interests and skills of teachers match the infinity of interests which will be expressed by potential students.

It is entirely conceivable that in life-long education of the future, the full-time teacher will be the generalist who organizes and manages teaching materials and who provides guidance and counselling services, while those who did not intend to become teachers, but who are specialists by virtue of success in their field, provide much of the actual content. The latter may do this in many ways; some will collaborate with professional educators in preparing new kinds of teaching materials, others will work with students in creative learning workshops and flexible learning experiences in an educational environment which has no levels, grades and classes in the traditional sense. Some form of validation that a person knew or could do a specified behaviour would exist, and this would be sufficient. Certificates issued to certify accomplishment would likely mean more than they do now, in that they would likely be accompanied by a detailed description of the skills and behaviours which the holder had demonstrated in the course of his or her learning career. Few certificates of accomplishment would be the same. Each would reflect the individual interests and abilities of the holder.

There would be no failures in such a system. The system would not be geared to separating the slow from the fast, or the polyvalent from those who are good only at certain things. It would be geared to helping people of all ages to explore their own skills, abilities and interests at their own pace and to the extent they wished. They could leave and return later in their lives and none would be ostracized for not maturing all of their interests when in formal school as children.

Some features of such a system can be noted in a variety of programmes in a number of countries. In Isfahan, Iran, an experimental functional literacy project for adults (with the collaboration of Unesco) has developed eighteen separate functional programmes in skills training and literacy for adults in the Isfahan region. These programmes were carefully developed after detailed socio-economic studies of the lives of the adults in the region. Thus, there is a programme for those who work on the land, for those who work in the new steel mill, for those who live in the city, for the women in the family, etc... The content is constantly changed as the needs and interests of the adults in the region are further known, through expression of the adults themselves and through study of what happens to people as they progress through the programme.

There was considerable initial investment in the preparation for the above project, in the preparation and testing of the teaching materials, the training of the new kinds of teachers needed to work appropriately with adults, and the new kind of organization necessary to provide teaching and learning sessions at the convenience of the participants. But this investment will surely pay off in achievement on the part of adults involved in the programme.

In Mexico, the Social Security Organization has pioneered in creating community centres located in workers' cities. These centres provide educational, recreational, cultural and sports activities for the entire family. Adults can attend a series of demonstration lectures on classical music, learn how to paint, take vocational and technical courses, participate in little theatre activity or the band, or play soccer, while the children engage in similar types of activities that interest them and their age group. Few of the staff of these centres are teachers by profession. Many come from many walks of life but find it fascinating to interact with adults in a life-long learning situation where people are freely exploring their own interests. A number of the staff are specialists in social work, another development worth noting. Social work has often been characterized by services which deal with remedial welfare activities, but the social worker of the future may be the organizer of life-long education, not for the drop-outs from society, but for those who are fully with it.

In French-speaking Africa, there are attempts to prepare elementary school teachers as "animateurs". Their rôle is to not only teach, but to encourage community development activities of all kinds. The rôle and function of these new kinds of teachers varies from country to country, but the effort represents an interesting attempt to prepare a new kind of teaching specialist compatible with new needs of the community.

The first step toward a concept of life-long education might well be to do an analysis of educational services already available in each country. Analyses of educational activity and expenditure often end with what the Ministry of Education does. Most ministries, however, have a variety of educational services and facilities and there should be much closer collaboration between these and the school. Teachers should collaborate with agricultural extension workers and vice-versa. Organizers of co-operatives should come to the school to help children understand what co-operatives are all about, and teachers should reciprocate by helping members of the co-operatives, perhaps, in developing countries, by holding literacy classes for co-operative members, teaching the mathematical skills necessary to understand accounting principles.

The possibilities are endless. And the teacher is at the centre of it all - both the teacher who has chosen to teach as a profession, and professionals in other fields who must be attracted to teaching.

LIFE-LONG EDUCATION OF TEACHERS

Most countries report some form of in-service teacher education, but it is often limited to summer courses for teachers offered by teacher-education institutions or to week-end seminars occasionally organized by school inspectors or supervisors. In-service teacher education in the future likely will be a more continuous life-long process and will include regular programmes or correspondence education and travelling instructors from teacher-education institutions and Ministries of Education who will organize

week-end seminars linked to correspondence and radio or television courses which run throughout the school year. Most countries are moving toward a continuous programme of curriculum reform in an attempt to keep up with the knowledge explosion and new forms of continuous in-service teacher education will be absolutely necessary in order to keep the teaching staff up to date.

There are examples of such correspondence study programmes that have resolved glaring deficiencies in the preparation of teaching staff. In Mexico, for instance, a large portion of the elementary school teachers in rural areas were completely unqualified some years ago until an extensive programme of year-round correspondence study, radio education, and travelling seminars was organized. Now, virtually all of Mexico's rural elementary school teachers have received at least the minimum acceptable level of education, most without having left the towns where they were assigned. In the Middle East, correspondence study and travelling seminars are used for the continuous, throughout-the-year in-service training of Arab refugee teachers. In many other countries similar approaches are being attempted.

In-service education must be directed at full-time teachers. Part-time teachers at any level are ineffective no matter how much in-service teacher education is attempted. Similarly, in-service education staff must be full-time and the programme properly budgeted. Otherwise, the programme cannot be continuous or well managed.

RURAL TEACHER EDUCATION

In any country where there are large numbers of unqualified teachers, the problem is further exaggerated in the rural areas. Teachers who are qualified compete favourably for the posts in towns, and the villages are left with the lesser qualified.

Furthermore, there is some suspicion that what should go on in a rural school might be somewhat different than that which should go on in an urban school. If this is so, then the teacher should probably be trained somewhat differently so as to be able to do these things.

A number of countries have begun a programme of teacher-education institutions located in rural areas and which train teachers in those skills necessary to work with rural children on the problems that they will face as they leave school. Some of these programmes show some success in keeping teachers in rural areas once they complete their training, though differentiated programmes of rural education still leave much to be desired. For one thing, the migration to the city is motivated by many factors other than the education that children get or do not get in school and it is too much to depend on the school to stem the tide. Secondly, the kinds of agricultural development which will demand educated farmers takes more than simply more education. Investment in new agricultural equipment, massive changes in the economic and marketing infrastructure supporting agriculture, and similar developments must go hand in hand with increased rural education.

Nonetheless, the attempts to ruralize education and related teacher training will lead to new forms of education more suited to the lives of rural people. Such approaches, if accompanied by investment in other sectors of the rural economy, will be increasingly fruitful.

UNIVERSITY-BASED OR SEPARATE

A significant concern in many countries is whether to base teacher education, at least at the higher levels, at the university or to maintain separate teachers' colleges.

Conceptually, it makes good sense to educate teachers side by side with other professionals in training. Teachers who have been segregated in a teachers'-training college have not had the advantage of the concentration of intellectual resources at the university, nor can they completely escape the feeling that their institution is second-rate. In some countries where teachers' colleges once existed, many of the colleges have now become universities. Accordingly, it may be reasonable for some countries to begin with teachers' colleges because of the priority manpower demand for teachers at the present time, with the notion of the later possibility of transformation of the colleges to university status as other manpower needs become pressing.

A number of countries feel that teachers' colleges are necessary because the university is not interested in the teacher-education problem and will not give proper attention to it. The attempt of some universities to limit themselves to traditional, prestige fields, a legacy from the days when the university admitted only the élite, is inconsistent with the modern rôle of a university.

Many of the interdisciplinary studies appropriate in the education of tomorrow's teachers, and many of the specialist skills needed, will depend on intellectual resources found in many university departments. More and more, academicians in many social science disciplines, such as anthropology, linguistics, sociology, and economics, are applying the insights of their disciplines to the study of educational problems. Those in physical sciences and the humanities are collaborating with educators in the design of new teaching approaches in their fields. Those in many professions, including management sciences, engineering, public and international affairs, urban affairs and others, are contributing to the development of new educational strategies. The university which isolates its faculties from collaboration on such matters is isolating itself from some of the most crucial problems of the nation.

EDUCATIONAL RESEARCH AND DEVELOPMENT

The better teacher-education institutions in all countries not only are teaching teachers, but are participating in research on the critical questions people are asking in education these days. They are developing new

approaches to curriculum and preparing and testing and validating new curriculum materials. They are working with schools in the design of new structures and forms and new ways of teaching. They are collaborating with other institutions in the design of teaching and learning systems which will make possible the intelligent use of broadcast instruction, satellites, computer-assisted instruction, and new kinds of information storage, transmission and retrieval devices of all kinds. Teachers and specialists in training are participating jointly with the faculty in these activities and will thus become leaders of innovation when they take up their posts in the educational system. Teachers already in service collaborate with such teacher-education institutions in the design and conduct of research and development activities and thus receive a superb form of in-service training as a by-product.

Examples of such activity are numerous. The national technical teacher education school in Beirut has pioneered in the development of programmed instruction material for the schools of Lebanon. The National Council for Research and Training in Delhi not only undertakes a variety of teacher- and specialist-training activities for the entire country, but prepares and tests prototype teaching materials and equipment, is now entering into a new project to prepare instructional materials for television and possibly for use by satellite in 1974, and is generally at the forefront of research and development activities of all kinds.

In Colombia, the national pedagogical university is the home of the national educational research centre, which is autonomous of the school but which collaborates closely with it. Similar arrangements often exist between national curriculum materials centres which develop and test new kinds of teaching and learning materials.

Close linkage between research and curriculum development centres and teaching-training institutions is beneficial to both programmes. The quality of teacher education is improved by virtue of the creative people who are often attracted to the research centres, and the research centres profit from contact with the new teaching generation. When the teachers in training enter their posts, they are already familiar with the newer approaches being developed by the research and development specialists and they are prepared to put them into practice.

THE CHALLENGE OF EDUCATIONAL REFORM

Educational reform is the key concern in many countries today. There is considerable evidence to suggest that schools may not be teaching what they should be teaching, and that whatever they teach could be taught much faster and much more successfully, perhaps saving as much as one half of the class and teacher time now spent in producing a successful school graduate. Because of high drop-out and repeater rates, some educational systems now take the equivalent of 15 years of class space and teacher time to produce one primary school graduate with six years of successfully-completed education. The situation at the secondary level is often not much better.

Reformed educational systems will invest more in curriculum research and development, will provide more and better teaching materials for the schools, will train teachers and specialists better, pay them better and will build better schools with programmes more flexibly structured so that they can serve more community needs. The overall effect of such reforms may be such increased efficiency that the per-successful student cost would not be much more than at present.

Reform of teacher and specialist education must be at the centre of overall educational reform. Teacher education institutions themselves must spearhead reform, must be at the forefront of innovation and creativity. The teachers and specialists they produce must be managers of reform.

The successful citizens of the future will become that way in large part through the effects of teachers and specialists we are preparing today. Let us have teachers for citizens of tomorrow, and not of yesterday.

ANNEX

Estimated number of teachers by level of education, 1968/1969

Thousands

Major Region	Number of teachers				Pupil/Teacher ratio First Level only
	Total	First Level (excluding pre-primary)	Second Level (General, Vocational and Teacher Training)	Third Level	
World Total(1)	18,239	10,769	5,813	1,657	31
Africa	973	730	212	31	40
Northern America	2,910	1,295	1,061	554	26
Latin America	2,038	1,257	634	147	32
Asia(1)	5,714	3,708	1,652	354	36
Europe & USSR	6,409	3,676	2,180	553	25
Oceania	195	103	74	18	28
(Arab States)(2)	(483)	(324)	(142)	(17)	(34)

(1) Not including China (Mainland), the Democratic People's Republic of Korea and the Democratic Republic of Viet-Nam.

(2) The figures relating to Arab States are included partly in the figures for Africa and partly in the figures for Asia. They are shown here for information only.

Source: Unesco Statistical Yearbook, 1970.